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**RESTORING RUSSIA'S ENVIRONMENT:
A STRATEGIC CHALLENGE TO THE UNITED STATES**

BY

LIEUTENANT COLONEL A. ALLEN RASPER
United States Army

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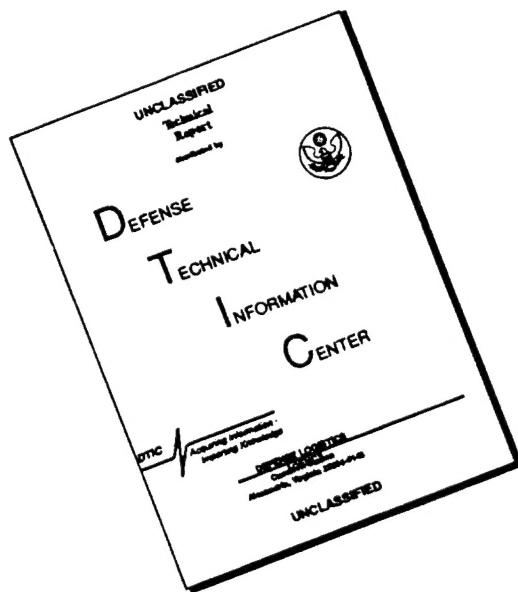
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Lieutenant Colonel A. Allen Rasper
United States Army

Colonel Jack W. Ellertson
Project Adviser

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U.S. Army War College
Carlisle Barracks, Pennsylvania 17013

ABSTRACT

AUTHOR: A. Allen Rasper (LTC), USA

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The magnitude of environmental devastation throughout the Former Soviet Union is becoming more apparent as the countries transition to democracy and they more openly discuss their past practices, current problems, and future direction. This study explores the strategic implications of Russia's environmental problems. It endeavors to answer several related questions: Should the United States be concerned about the environmental devastation that exists in Russia? How severe is the problem? What are the ramifications? What corrective action is Russia taking? How is the United States helping?

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Introduction

The global environment provides the world's people with the resources -- air, water, food, minerals, raw materials -- needed to survive and prosper. Failure to protect and preserve our environment jeopardizes our quality of life, economic prosperity, and world order.

Good environmental stewardship is one of our greatest challenges. Social responsibility, availability of capital, and stable governments that can create and enforce regulatory policy and combat crime and corruption all characterize an environmentally responsible country. Unfortunately, there are regions of the world where few of these conditions exist. Compounding the problem is the fact that in some countries national economic policies and initiatives are not necessarily conducive to responsible environmental leadership. For instance, some countries are striving for rapid economic expansion and dominance, so they have little interest in diverting capital to non-revenue producing programs and little concern for the long-term preservation of natural resources. Other countries are struggling, trying to make the very difficult transition to a free market economy. Frequently, these nations have antiquated industrial infrastructures, fragile governments, limited experience in environmental protection, and/or little capital to spend on protecting the environment. Still other countries may have centrally managed, quota-driven communist economies; their

governments are results-oriented, have little regard for the health and well-being of their population, and businesses with few, if any, incentives to protect the environment.

Russia probably presents the greatest environmental challenge the world has ever faced. The Former Soviet Union's (FSU) rapid military expansion, its use of massive centrally managed and quota driven industrial complexes, and its unrelenting pursuit of nuclear dominance has left Russia in an environmental shambles. No other industrial nation has so systematically poisoned its land, air, and people over so long a period. Russia's environmental problems include contamination from the testing, manufacturing, storing, and dismantling of nuclear, biological, and chemical weapons (weapons of mass destruction -- WMD), industrial air pollution, acid deposits, and pollution of water and soils by municipal sewage, industrial waste, agriculture, and animal husbandry. Russia faces many economic, fiscal, political, geographical, and ethnic challenges as it struggles to reverse past environmental practices and works to clean up, protect, and preserve its environment.

Should the United States be concerned about the environmental devastation that exists in Russia? How severe is the problem? What are the ramifications? What corrective action is Russia taking? How is the United States helping? Are the kinds and amount of U.S assistance appropriate? This paper seeks to answer these questions.

Russia's Environment - A U.S. National Security Issue?

In 1993, the U.S. Secretary of Defense defined four national security threats to the United States: regional dangers, nuclear dangers, dangers to democracy, and economic dangers.¹ The environment is an important element in each of these threats. President Clinton has recognized the importance of the environment by highlighting it in his national security strategy, "A National Security Strategy of Engagement and Enlargement":

Not all security risks are immediate or military in nature. Transnational phenomena such as terrorism, narcotics trafficking, environmental degradation, natural resource depletion, rapid population growth and refugee flows also have security implications for both present and long term American policy...The more clearly we understand the complex interrelationships between the different parts of our world's environment, the better we can understand the regional and even global effects of local changes to the environment. Increasing competition for the dwindling reserves of uncontaminated air, arable land, fisheries and other food sources, and water, once considered 'free' goods, is already a very real risk to regional stability around the world. The range of environmental risks serious enough to jeopardize international stability

extends to massive population flight from man-made or natural catastrophes, such as Chernobyl..., and to large-scale ecosystem damage caused by industrial pollution, deforestation, loss of biodiversity, ozone depletion, desertification, ocean pollution and ultimately climate change. Strategies dealing with environmental issues of this magnitude will require partnerships between governments and nongovernmental organizations, cooperation between nations and regions, and commitment to a strategically focused, long-term policy for emerging environmental risks.²

The President's acknowledgement that the environment is an important element of our national security strategy is a significant first step. Regarding Russia, what environmental implications are inherent in each of the four threats cited in the national strategy -- dangers to democracy, economic dangers, nuclear dangers, and regional dangers?

Dangers to Democracy

An important U.S. national interest is Russia's smooth transition to a democratic state. Emerging democracies must demonstrate their competence and responsiveness to the needs of the people. Failure to do so undermines the government's legitimacy and threatens the stability of the government.

Environmental factors, although not the primary cause for the collapse of a government, may serve as a catalyst. The potential for governmental instability exists when the electorate loses confidence in the government's ability to provide for their basic needs -- food, good health, and an acceptable work environment. Supplying basic needs and an improving quality of life are dependent on good environmental stewardship.

Basic Russian health standards have deteriorated significantly. Poor health affects any nation's ability to build and maintain a productive, creative population capable of building and managing sophisticated socio-economic systems. Russia's health problem will only worsen if she fails to stem industrial pollution of rivers and land. She must stop dumping nuclear and other toxic waste into the Arctic Ocean and the Baltic and Japan Seas; she must cease operating unsafe nuclear power plants. Russia's labor force is dwindling during a period when creative minds, innovative entrepreneurs, and energetic and well-trained laborers are at a premium. Russian life expectancy is at a 30-year low and continues to decline. In 1993, deaths exceeded births by about 750,000 persons.³ Maternal death during childbirth is six or seven times higher in Russia than in the United States.⁴ Only 40 percent of all Russian children are considered "healthy" at birth.⁵ The illness rate among newborns has more than doubled, from 82.4 per 1000 live births in 1980 to 173.7 in 1991.⁶ These health problems can all be traced to Russia's total disregard for a clean environment.

As Russia transitions to a democracy, her people will gain greater access to shocking information about the environment in which they live and work. They will also become more informed about initiatives, or lack thereof, to improve their quality of life. If the government fails to reverse the negative health trends and to demonstrate that it is improving the living, working, and agricultural environment, the populace may protest and create an increasingly unstable political situation. Russia's experiment with democracy could then fail, thus causing renewed concerns for the United States.

Economic Dangers

Past and present environmental practices threaten Russia's economic revival. Although Russia poses few economic challenges to the U.S., it does provide economic opportunities. Russia's conversion to a free market economy is considered an important U.S. national interest. Past Russian practices have wasted scarce resources. Sea life, agricultural goods, livestock, timber and other raw materials, minerals, water, and clean air are all essential to developing a vibrant economy. All have been negatively affected by the FSU's mishandling of the environment. Russia must now live with that legacy, but she must as well take actions to reverse past practices and rejuvenate that which has been damaged. Vast quantities of capital are needed to remedy the problem and to sustain environmentally sound practices.

Unfortunately, there are numerous competing demands for capital in this capital-poor country. Diverting money to mend environmental problems takes away much needed capital required for modernizing the country's industrial, transportation, and communication infrastructure. Modernizing the country's infrastructure is absolutely essential to economic growth. Yet Russia's industrial modernization must include prevention of pollution, control of industry's environmental impacts, and clean up of yesterday's messes. Failure to incorporate sound environmental practices during industrial expansion results in accelerated pollution and exceeds nature's ability to regenerate at a rate that meets demand. The Russian government thus has a delicate balancing act in its hands. It must carefully expand the economy while caring for the environment. Failure to do so may result in a collapsed economy and/or a disgruntled population. Such conditions could lead to governmental instability. An unstable Russia poses a major security risk to other nations of the world.

Nuclear Dangers

Russia possesses large quantities of nuclear, biological, and chemical weapons and waste materials left from the dismantling of her vast WMD arsenal and decommissioning of her nuclear reactors and antiquated, unsafe power plants. The United States has identified the control, security, and reduction of

Russian WMD as a vital interest. Radioactive materials are reportedly produced, used, and stored in 320 cities and 1,548 other locations within Russia.⁷ More than 260 areas of radioactive contamination have been identified throughout Russia.⁸ Past disposal and testing practices have led to irreversible contamination of natural resources. Eleven nuclear reactors require radical reconstruction because of the repeated failure of obsolete or worn-out equipment and system components, inadequate stress tolerances in their design, and outdated safety standards.⁹ The Russian Federal Nuclear and Radiation Oversight Committee identified approximately 20,000 safety violations in a 1993 inspection of Russian nuclear plants.¹⁰ Vast quantities of radioactive material, accident-prone reactors serviced by a workforce with less and less reason to be conscientious, and a dysfunctional bureaucracy are causes for great concern. Russia and the world cannot afford a repeat of a Chernobyl-type accident and associated health consequences. Such antiquated facilities are particularly vulnerable to terrorist groups, black-marketeering, and foreign industrial espionage. Russia's industrial secrets, nuclear weapons materials, or even nuclear weapons may be particularly vulnerable, given the disarray of the economy, the unstable social and ethnic situation, ongoing political turmoil, nonpayment of wages to personnel, and recurring threats of strikes at various secret facilities. Past mismanagement of WMD materials has resulted in questionable storage procedures and poor accounting for hazardous materials,

which makes it difficult even to determine whether potentially dangerous materials are missing. There is no easy solution in sight. Russia simply lacks the money, technological knowledge and capabilities, and managerial expertise to rapidly dispose of these waste materials. This situation poses a long-term international WMD danger and a possible threat to the United States.

Regional Dangers

Russia's environmental problems also effect her neighbors. Air pollutants and contaminated waters know no boundaries. Polluting industries contaminate rivers that run through many countries -- killing fish, clogging waterways, endangering local populations and agriculture, and eventually depositing poisons into international waters. Groundwater contamination spreads across national borders and air pollution blows across borders.

Ecosystems of neighboring nations are inextricably linked. Examples of transboundary pollution originating in Russia are numerous. Radioactive contaminated caribou and migratory ducks have been found in northwest Alaska.¹¹ Elevated levels of PCBs, DDT, HCH, and heavy metals have been detected in the central Arctic Ocean and have reached the shores of Canada, Greenland, and Svalbard.¹² Black Sea contamination has reduced the annual fish catch from 1.5 million tons in 1985 to 100,000 tons in

1994.¹³ Russia's immense forests provide the world's second largest natural reservoir for absorption of carbon dioxide and production of oxygen. Chemical pollution of the air and acid rain contributes to the loss of five million acres of Siberian forests each year.¹⁴ Continued losses of this magnitude will negatively impact our global climate. Because environmental problems of one country are inextricably linked to its neighbor countries' environments, environmental abuse and mismanagement can trigger regional economic, social, and political tensions. As the primary source of regional environmental pollution, Russia could trigger massive population migration as people seek cleaner environments. Further Russian recalcitrance on the environment could as well trigger regional conflict from neighbors no longer fearful of the Russian bear.

The center of gravity for political stability is the populace. A country's government remains viable as long as that country's population senses that their quality of life is improving or is maintained at an acceptable level. Pollution from a neighboring state may cause migration as individuals living near borders or along pollution "highways" seek higher quality soil for agricultural production, or cleaner water for fishing, or safer air and water for livestock or for human consumption. This migration can trigger civil unrest and disenchantment with one's neighbors. The second or third order effect of displacement is a crumbling government or the desire to lash out at one's neighbor. Such conflict may require the U.S.

to broker a diplomatic settlement or to commit new or increased monetary and/or military aid.

Finally, WMD may create regional dangers. To gain clean-up funds, nations with WMD production capabilities or weapons may illegally transfer highly sensitive technologies or weapons to undesirable third parties. These third parties could use this capability for black-mail. Unattended environmental problems undoubtedly create challenges to regional stability.

In short, the environment plays an important role in maintaining world order. Environmental problems impact on regional, nuclear, democratic, and economic stability. Russia's current environmental challenges impact on both U.S. and Russian national security interests. Because Russia has neglected the environment for so long, the problem has reached a crisis. As the world's sole superpower, the U.S. must, as usual, respond to this multifaced crisis. Our response should begin with an assessment of the situation. How badly damaged is the Russian environment?

Environmental Devastation - How Bad Is It?

Russian authorities estimate that 15% of Russia is considered an ecological disaster zone and that 20% of its population lives in this environmentally troubled area.¹⁵ The magnitude of the problem, however, cannot be defined only in

physical terms. An examination of attitudes, philosophical and institutional, is also appropriate because it offers insights on how quickly Russia may be able to implement programs that will ultimately lead to responsible environmental stewardship.

Changing the attitudes of legal reformers, industrialists, politicians, lawmakers, and farmers is critical to correcting past abuses and preserving the environment for the future. A 1995 survey of political parties by the Russian branch of Greenpeace produced discouraging results. The survey queried political parties on the country's environmental problems and on actions being taken to solve the problems. Of eleven parties surveyed, four refused to answer questions, while seven showed a high level of awareness and were critical of the government's environmental policy.¹⁶ None of the parties offered comprehensive solutions to the problem. Social and economic woes were frequently blamed for the government's inability to commit substantial funds to environmental programs. Four parties promised to do everything within their means to correct past abuses and to develop programs that preserve the future. Their promises included consulting with environmentalists during the drafting of new progressive laws.

Russia's troubled transition to a democratic state is further exacerbating the implementation and enforcement of aggressive environmental laws. Because Russia's transition to democracy is still in the formative stages and because the population is concerned about economic survival, Russian

authorities are too weak to enforce compliance with environmental legislation. Widespread corruption at the local level and corporate financial and regulatory privileges during this transitional period further complicate the situation. Until attitudes change and these structural cancers are eliminated, it will be difficult to make major strides in solving Russia's environmental problems.

Restoring Russia's environment to internationally recognized standards and levels acceptable to the Russian people will take decades, possibly five to ten, maybe more. The following examples highlight the magnitude of environmental pollution and provide insights as to why recovery will take so long.

Industrial and Chemical Water Pollution

The poor water quality in Russia probably poses the greatest concern to the Russian people since it so negatively effects health standards, quality and quantity of food, and the ability to make a living off the land. The water in approximately 75% of Russia's lakes and rivers is highly contaminated. The contamination is so high, in fact, that nearly 50% of the tap water fails to meet acceptable sanitary levels.¹⁷ Old and poorly maintained water treatment facilities are unable to screen out the high levels of microbiological, chemical, and other contamination. The equipment and technology are so old and the

pollution so great that only 30% of the river and lake water is suitable for processing to drinking water.¹⁸ Water contamination has reduced Russia's fish catch to about one-third what it was in the early 1900's, and the fish that are caught are highly contaminated.

The Volga River is Europe's longest waterway and is a major source of economic development. More than 60 million Russian people live along the basin. The river holds 46% of Russia's industrial potential, 50% of its agrarian offerings, and 20% of its fish catch.¹⁹ Unfortunately, the river has suffered from years of agricultural, industrial, and military abuse, resulting in astonishing concentrations of pollutants. In one area, copper and nitrogen concentrations are 100 times greater than acceptable standards, and phenol and petroleum concentrations are ten times greater than allowable levels. These conditions provide an ideal environment for the growth of poisonous algae.²⁰

The Black Sea, Caspian Sea, Oka River, Ivankovskoe Reservoir, and Lake Baikal are highly polluted bodies of water. The Black Sea "contains 565,000 tons of mineral nitrogen, 55,000 tons of mineral phosphorus, 206,000 tons of oil, 4,590,000 tons of iron, 1,700 tons of arsenic, and 900 tons of cadmium."²¹ The Caspian Sea has approximately 44 milligrams of pesticide per liter of water.²² Near Dzerzhinsk, the Oka River (feeds into the Volga) has levels of ammonium nitrate that exceed official limits by almost 80%.²³ Moscow's primary potable water source, Ivankovskoe Reservoir, contains high levels of phenols and heavy

metals. Lake Baikal, the world's fifth largest fresh water lake, has suffered extensive pollution from the local paper and pulp industry.

Nuclear Dangers and Radioactive Contamination

Although the Russian people appear to be most concerned about water pollution, the remainder of the world is most concerned about Russia's nuclear power facilities and weapons and the pollution generated by their contaminated waste. The 26 April 1986 Ukrainian nuclear accident at Chernobyl, the world's worst civil nuclear disaster, serves as an example of what could easily happen in Russia.

The Chernobyl accident caused radiation levels to increase 2,500 times, resulted in at least 235 radiation-induced diseases, and required the relocation of 92,000 people.²⁴ Although the accident did not occur in Russia, a similar accident could easily be repeated in Russia if appropriate safety measures are not taken. Russia's 270 recorded malfunctions at nuclear facilities in 1991 simply reinforces the point.²⁵

Russia has 15 Chernobyl type (RBMK) nuclear reactors. Western experts consider the plants hazards; they are essentially unrepairable. The other reactors (VVER type), although less hazardous, also have numerous safety problems. In 1992, a core meltdown was narrowly averted at a nuclear power plant near Saint Petersburg. In 1994, the Beloyarsky reactor caught fire.

Russian officials estimate that \$26 billion and 10 years of repair effort are needed to modernize Russia's power plants so that they meet Western safety standards.²⁶ To date, the West has offered \$1.6 billion to help repair the facilities.²⁷

Civil nuclear explosions are another major source of nuclear contamination. Satellite generated radiation maps identify over 130 civil nuclear detonation sites in Russia.²⁸ These nuclear explosions were carried out to conduct geophysical investigations, to move earth during dam construction, or to release deposits of natural gas and mineral oil. Although their specific impacts on land, water, wildlife, and people are unknown, satellite imagery indicates damage is significant.

Nuclear waste is so extensive that it will take years to determine the full impact on the ecological system, years to accurately assess the amount and location of the waste, and decades to properly dispose of the retrievable waste. Between 1964 and 1986, approximately 17,000 canisters (about 30 million curies) of radioactive waste were dumped in the Baltic, White, Barents, Bering and Kara Seas and the Sea of Japan.²⁹ In 1985, a refueling mishap in Chazhma Bay, Sakhalin Island, resulted in the release of 7 million curies of radioactivity.³⁰ In 1989, the submarine Komsomolets sank in the Norwegian Sea. It was carrying over 150,000 curies of fission material and 8 kg of plutonium.³¹ The 1950's sinking of a ship containing radioactive waste in Lake Ladoga is threatening Saint Petersburg's water supply.³²

Leaking radioactive waste at a reprocessing plant at

Krasnoyarsk resulted in the accumulation of thousands of curies along the Yenisey and Ob rivers.³³ Life expectancy for those living along the Yenisey and Ob deltas has dropped 16 years since 1961. Their life expectancy is now 25 years below the Russian average.³⁴

Radioactive waste accumulated during the production of weapons-grade plutonium in the Chelyabinsk region has polluted the Techna River, which feeds Lake Karachya. More than 1.2 billion curies were dumped directly into Lake Karachya. 1990 gamma ray measurements along the lake's shore surpassed 600 roentgens per hour, an amount that exceeds the average acute lethal dose for humans.³⁵

In 1957, a 300 cubic meter nuclear waste holding tank located at the Mayak reprocessing plant in Chelyabinsk exploded, releasing 20 million curies of radiation. 17,500 people were evacuated and an additional 250,000 people were exposed to the fallout. Radioactive dust was found 75 kilometers away.³⁶

In 1993, 77 square miles of forest and snow were contaminated when an explosion occurred at the Tomsk-7 plutonium-processing facility.³⁷ High levels of beta radiation were detected in the accident region. The effect of the contaminated dust on the ecosystem following the summer thaw will never be fully understood.

Decommissioning submarines and other naval vessels also poses a major challenge. Before the year 2000, Russia will need to decommission approximately 170 (1993 estimate) ships and

submarines.³⁸ Disposal of nuclear waste from these vessels will overwhelm Russia's logistics capability. Given current transportation limitations, it will take 30 years to transport submarine nuclear waste, alone, to disposal sites. This is because Russia has only one serviceable train capable of carrying nuclear waste; it can make only six trips per year.³⁹ Russia's navy has approximately 30,000 spent fuel elements that must be destroyed. That equates to about 140 reactor cores.⁴⁰ Prof. Yablokov, former environmental advisor to President Yelstin and currently president of the National Ecological Security Council, estimates that it will take Russia 150 years to reprocess existing stockages of spent nuclear fuel, using existing facilities.⁴¹

Chemical and Biological Weapons Waste

Chemical and biological weapons pose a greater threat to Russia's environmental security than they serve in protecting the homeland. The weapons become increasingly unstable the older they get. Additionally, agents that were discarded at sea in special containers pose possible risk to humanity should they be disturbed by unsuspecting fishermen or washed ashore. Following World War II, the FSU dumped several hundred thousand tons of captured German chemical munitions into the Baltic Sea. In the 1960's, 1,200 tons of mustard gas were buried on the outskirts of Chapayevsk.⁴² Today, over 40,000 tons of various chemical

warfare agents are stored throughout Russia.⁴³ In 1979, the Institute of Military Epidemiology inadvertently released spores of anthrax into the surrounding environment, thereby triggering an epidemic of pulmonary anthrax in the neighboring community of Yekaterinburg.⁴⁴ Russian authorities estimate that it will cost approximately \$10 billion to destroy their vast stockpile of chemical weapons.⁴⁵

Contamination Caused By The Oil Industry

Approximately 920,000 barrels of oil are spilled daily in Russia.⁴⁶ That equates to about one Exxon Valdez spill every six hours. In 1989 and 1993, there were 500,000 and 420,000 ton spills in the Tyumen region and Oka River, respectively.⁴⁷ Currently, there is a major effort to clean up an oil spill in Siberia that is 6 feet deep, 4 miles wide, and 7 miles long.⁴⁸ The age of the pipelines -- over 20 years -- and construction techniques are the major source of Russian oil spills. To expedite pipeline construction, contractors were authorized to install cutoff valves every 30 miles instead of the internationally recognized standard of three miles.⁴⁹ Naturally, when the decrepid pipeline springs a leak, 30 miles of oil may spill out. Monitoring oil industry practices helps to reduce irresponsible business practices and helps to alert industry and government authorities of pending crises. Unfortunately, only seven environmental inspectors are available to monitor the

Tyumen oilfield complex, an area twice the size of France.⁵⁰

Emission of Pollutants into the Atmosphere

Air pollution is incredible. 75% (110 million) of the Russian population breathe air that is polluted beyond legal limits.⁵¹ 68 cities exceed acceptable air quality indexes by a factor of 10 or more.⁵² The hardest hit areas are Moscow, Chelyabinsk, Norilsk, and Kemerovo. During its peak producing years, the Norilsk Mining and Metallurgical Combine emitted 22.5 million metric tons of air pollutants annually. Current annual emissions are approximately 1.95 million tons. Health studies for the past forty years show that the lung cancer rate in the vicinity of Norilsk is 3.5 to 4.5 times higher than that in other Siberian cities. Infant mortality and birth defects are approximately 25% and 60% higher, respectively, than the national average.⁵³

The nickel smelter at Nikel, on the Kola Peninsula, has created a barren area stinking of sulfur. The landscape is void of plant life, traffic, houses, and people. In 1994, 180,000 tons of sulfur dioxide were emitted into the atmosphere, down from 250,000 tons in 1991.⁵⁴ Although the discharge is down -- due to less production, not to improved environmental practices -- Russia continues to violate the Convention on long-Range Transboundary Air Pollution. These examples illustrate why the life expectancy in northern Russia is 50, down from 62 in 1965.⁵⁵

Russian industries continue to emit 90,000 tons of ozone-depleting gases (chlorofluorcarbons) every year. Emission of chlorofluorcarbons violates the 1987 Montreal protocol entitled "Convention for the Protection of the Ozone Layer." The protocol calls for an end to the production of ozone-depleting gases (chlorofluorcarbons) by 1 January 1996. Russia acknowledges their violations and has requested a four-year extension in implementing the Protocol. To justify the request, Russia cites lack of capital and need for factory modernization.⁵⁶

Destruction of Forests

The Siberian forests are being destroyed at a rate of approximately 5 million acres per year.⁵⁷ Most of this damage is caused by air pollution and poor logging practices. Gas flares in the Tyumen oil fields send noxious sulfur dioxide billowing across the Siberian forest. Indiscriminate clear-cutting exacerbates the problem. Continued unsound forestry practices will result in the disappearance of the Siberian forests in the next 30 years, assuming current practices are continued.⁵⁸ Since the Siberian Forest is the world's second largest producer of oxygen and carbon dioxide absorber, continued neglect of this magnitude will negatively impact our global climate.

Chechnya

Chechnya presents unique challenges for Russia. Quelling the Chechyan revolt is diverting scarce capital that could be used on protecting the environment. Simultaneously, military operations are damaging an already fragile infrastructure, thus requiring additional unavailable capital to restore Chechnya's environment. The Russian Security Council's Interdepartmental Commission on Environmental Safety recently reported that environmental problems in Chechnya have increased significantly since the start of military operations. Water is more polluted, more toxic substances have been released into the atmosphere, and the radiological situation has worsened. Concrete data is available only for petroleum pollution. Approximately 700,000 to 800,000 metric tons of petroleum products have accumulated in the Sunzha riverbed; the critical pipeline passing through Chechnya has sustained major damage in nine areas; and petroleum levels in the Terek River exceed maximum allowable amounts by 50 to 137 times.⁵⁹

The above examples merely scratch the surface. The three maps at Appendix 1, 2, and 3 help to highlight the magnitude of Russia's environmental devastation.⁶⁰ Not addressed in this paper are the effects of totally inadequate water-treatment facilities, lack of toxic waste disposal sites, management of solid household waste sites, and antiquated exhaust systems found

on an ever-growing transportation fleet. Murray Feshbach's Ecological Disaster, Cleaning Up the Hidden Legacy of the Soviet Regime and Philip Pryde's Environmental Resources and Constraints in the Former Soviet Union provide in-depth studies of the magnitude of Russia's environmental problem. Suffice it to say, the problem is real. It greatly exceeds the environmental challenges facing any other country in the world. Russia's environmental problems affect the rest of the world in one way or another. So what is Russia doing to solve the problem?

Russian Initiatives - Progress But With Pockets of Resistance

The Russia people are becoming more concerned about environmental hazards. A 1995 public opinion poll identified the environment as the third greatest concern regarding Russian life today.⁶¹ Given the magnitude of the problem and the limited capital available to dedicate to the problem, Russia has concentrated on stabilizing and conserving what has not been destroyed, rather than on trying to repair past damage.

Russian initiatives to establish environmental responsibility started in 1991 with the creation of Russia's first environmental law. In October 1993, the Russian National Security Council established the Center for Russian Environmental Policy. In June 1994, the first nationwide environmental conference was held. Over 200 Russian public, state, and business organizations attended the "Ecology in Russia"

conference. Grassroot initiatives have led to decentralized environmental management and the creation of laws, providing fines for abuse of the environment.

Russia's new environmental laws are broad-based; they provide a good foundation. Since 1991, laws have been passed on forestry, use of underground resources, water resources, wildlife, hunting, fishing, and the establishment of national parks and protected areas. Industry is now required to prepare environmental impact statements prior to construction; now they must pay for their use of natural resources. Fines have been imposed on industry for pollution and damage caused to human health and to property. Laws empower local officials and individuals to sue polluting businesses and demand their immediate closure. As an incentive, tax privileges have been devised to encourage responsible environmental practices.

Creating the legal means to fight pollution is absolutely essential. It demonstrates resolve. Unfortunately, if the laws were strictly enforced, approximately 80 percent of the country's factories could be shut down immediately.⁶² Additionally, the judicial system is so ill-equipped it would quickly become overwhelmed if citizens and local governments wanted to press the point.

Even though laws are being enacted, environmentalists still have a challenge. Prof. Yablokov claims that one month President Yelstin and the government enact laws that promote environmental responsibility, then the next month they yield to the pressures

of industrialists and either reverse the laws or ignore them.⁶³ Saving jobs is a higher priority for politicians than is saving the environment. Consequently, outdated, inefficient, bankrupt factories continue to receive subsidies in order to protect jobs. Given this emphasis on protecting jobs, managers of subsidized plants have little incentive to comply with the laws.

Educating tomorrow's leaders is an important aspect of environmental reform. Environmental conservation is being introduced into schools. The Chelyabinsk Ecology School offers a comprehensive program to teach the inter-relationships of the ecosystem; it educates children on how to preserve and protect the environment. Ironically, the school is located in one of the nation's largest metallurgical districts.

Other initiatives focus on preserving or reviving the environment. Implementation of national clean-up programs and participation in major international environmental agreements help to achieve those goals. Participation in agreements helps Russia gain technical and intellectual knowledge and funds that are absolutely essential for environmental improvement. Russia is a party to the following agreements: Air Pollution, Air Pollution-Nitrogen Oxides, Air Pollution-Sulfur 85, Antarctic Treaty, Climate Change Convention, Convention on International Trade in Endangered Species of Wild Fauna and Flora, Environmental Modification, Hazardous Wastes, London Convention on Marine Dumping, Nuclear Test Ban, Montreal Protocol on Substances that Deplete the Ozone Layer, Ship Pollution, Tropical

Timber 83, Wetlands, and Whaling. Russia has also signed but not ratified the Air Pollution-Sulfur 94, Antarctic-Environmental Protocol, Biodiversity, and Law of the Sea agreements.⁶⁴

Participation in the environmental agreements has helped Russia develop more comprehensive clean-up programs. One such program focuses on rejuvenating the Volga River. The program, "Revival of Volga in the Years 1996-2010," is designed to "preserve the natural environment and to ensure the health and vital activity of present and future generations."⁶⁵ Although the goals are on target, the project faces numerous challenges. The single greatest challenge is funding. The requisite \$3.27 million needed to carry out the project will come from federal funds partially raised by increasing water rates.⁶⁶ Critics assert that the Russian people cannot afford increased utility bills, and the federal government can hardly spare funds for such a program.

Russia has also designed a fifteen year (1995-2010) three billion dollar program to destroy 40,000 tons of chemical weapons.⁶⁷ This federal program has provisions that encourage foreign investment, both monetary and construction.

Russia has also aggressively pursued joint ventures in an effort to gain the financial assistance and technical and intellectual knowledge needed to restore the environment. The Japanese government is funding a \$26 million joint Russian, Japanese, American effort to safeguard the ecological security of the Russian Far East. The keystone to the effort is the

construction of a vessel capable of reprocessing 7,000 tons of liquid nuclear waste a year.⁶⁸

Russia and the United States have agreed on a joint venture to clean-up Lake Baikal. The agreement focuses on overhauling the only factory that dumps waste directly into the lake, the Baikalsk pulp and paper factory.⁶⁹ This is but one example of how the United States is helping Russia. Has the U.S. undertaken other initiatives? What strategy is America taking as it provides assistance to Russia?

United States Support to Russia

The U.S. has much to offer other countries of the world in terms of environmental expertise. Our intellectual, technological, governmental, non-governmental, legal, and industrial knowledge and experience are unmatched. Typically, the ability to implement environmental change is limited only by the people's desire for change and the amount of investment capital people, industry, and government are willing to allocate. In Russia, people want environmental reform. Unfortunately, they lack not only the capital but also the know-how. Since 1992, the United States has joined other countries and international organizations in helping Russia correct past environmental negligence and incorporating environmental responsibility in all facets of Russian life. Vice President Al Gore has been the catalyst for U.S. environmental support to Russia. He has

accomplished this through the Gore Chernomyrdin Commission, which has already met six times. American environmental assistance to Russia demonstrates our resolve for worldwide environmental responsibility. It serves as a vehicle to strengthen American ties with the Russian people and the government. It provides a non-threatening means to help encourage sustainable democratic and economic reform. Finally, it helps to generate jobs for American citizens and revenue for American firms.

Policy

U.S. environmental policy towards Russia emphasizes seeking high-payoff, low-investment opportunities that focus on "sustainable natural resources management, environmentally sound business development, training, environmental action planning, non-governmental organization (NGO) strengthening and partnerships, pollution prevention, and legal reform."⁷⁰ Through this policy, we hope to "promote sustainable growth, reduce environmental health risks and environmental degradation, and achieve environmental objectives at least cost."⁷¹

The U.S. Agency for International Development (USAID) and the Environmental Protection Agency (EPA) lead our efforts in Russia. Also participating are the Department of Agriculture, the Department of Interior's National Park Service, the Peace Corps, the Department of Defense, and the Department of Energy. Collectively, these U.S. agencies are working with Russian

counterparts to "improve environmental policies at regional and national levels, expand local capacity to address environmental issues, generate funds for environmental investment, support biodiversity, and promote environmentally sound industrial practices."⁷² These agencies identify projects based on environmental impact, cost effectiveness, and availability of funding.

One of the most fundamental and critical components of our support is our efforts to foster institutional change. Experts from the U.S. work closely with local and national officials on regulatory reform (such as pollution laws, environmental liability, and natural resource taxation), environmental assessment and development of solutions, and program and performance management. Workshops are conducted on a wide range of topics, such as environmental impact assessments, risk assessments, and methods of involving the public. These institution building initiatives are absolutely essential for a sustained environmental improvement program. The U.S. considers the institution-building aspect so important that we have provided an environmental policy advisor to the Federal Ministry of Environmental Protection to help review existing and proposed environmental laws.

PVOs and NGOs are essential contributors to America's support plan. NGOs and PVOs help to educate local groups by passing along information and insights -- both technical and political -- on how to monitor the environment and develop

grassroot organizations that can push local governmental organizations for change. Additionally, they pursue low cost, near-term, high-impact, grassroots projects. The Institute for Soviet-American Relations (ISAR), Ecologically Sustainable Development, Inc. (ESD), and KOMPASS Resources International are three very active NGOs/PVOs in Russia.

Projects

Environmental Policy and Technology Project

The six Gore-Chernomyrdin Commission meetings since 1993 have produced far-reaching environmental cooperative agreements with Russia. As V.P. Gore said on 30 January 1996, "Together, we are forging new solutions to such problems as drinking water quality in Moscow, air quality in southwestern Siberia and Volgograd, pollution from heavy industry in the Urals, land use and resource management in the Lake Baikal region, and sustainable forestry and biodiversity in the Russian Far East."⁷³ USAID's Environmental Policy and Technology (EPT) Project is the cornerstone USAID project that supports these initiatives. This initiative represents a collaborative effort between USAID, EPA, the private sector, and NGOs with FSU counterparts. \$120 million dollars was budgeted for this project during FY 93-95. The money supported EPT projects throughout the FSU. EPT projects in Russia include:

Nizhnii Tagil - This project assists city planners to

"prioritize environmental health risks and undertake low-cost/no-cost options to reduce pollution."⁷⁴ The lessons learned from this experience will be applied to other communities.

Moscow Water Quality - This project is designed to "assess and reduce human health risks from drinking water through better watershed management and pollution control."⁷⁵

Volgograd - Objectives in the Volgograd are twofold. First, air quality management; second, environmental economics and policy advice. The air quality management project is designed to "improve air quality monitoring methods, to develop new policies, regulations and standards for reduced emissions, and to identify low- and no-cost pollution reduction options."⁷⁶ This area is being used as a case study to teach Russian environmental policy makers how to set environmental priorities.

Lake Baikal - The Lake Baikal project supports a program of "sustainable land use planning and environmentally friendly economic development for the Baikal region. Local leaders are working with regional and national governments, NGOs, the private sector and the Baikal Commission to protect the lake and its watershed."⁷⁷

Khabarovsk - Projects in the Russian Far East are designed to protect the diverse flora and fauna in the region and demonstrate environmentally sound economic practices that encourage sustainable natural resources management. This project seeks to strengthen the NGO-government relationship.

Novokuznetsk - This demonstration project "combines local

and regional environmental planning, health-based risk analysis and specific initiatives to alleviate problems caused by industrial air and water pollution."⁷⁸ Additionally, a joint U.S.-Russian business cooperative has been established for the purpose of training Russian entrepreneurs. NGO-governmental cooperation is also a critical component of this project. Environmental NGOs in Russia receive seed money that help defray start-up costs.

Energy Efficiency and Market Reform - USAID is also funding (\$290 million for the FSU in FY 94 and 95) projects that improve efficiency in power production, delivery, and pricing, and nuclear power plant safety. Tests have shown that modest technical solutions can yield significant gains in pollution control.

Russia Energy and Environment Commodity Import Program - The \$90 million Commodity Import Program is designed to identify and transfer specific technologies that will help Russia improve energy efficiency in an environmentally sound manner. The program focuses on equipment needs in the areas of natural gas, oil, district heating systems, power, coal mining, and environmental measuring and monitoring equipment.

Exchanges and Training Program - Approximately \$303 million (through FY95) have been allocated to support U.S.-sponsored

training opportunities with educational, governmental, and private sector organizations. Under the Department of Defense's (DOD) Legacy Natural Resources Program, Russia sent biologists, foresters, and natural resource specialists from the civilian and military sectors to workshops the summers of 1994 and 1995. Training included environmental policy development and environmental program management. The \$303 million Exchange and Training Program is open to all FSU states.

Nunn-Lugar Legislation - The Nunn-Lugar Act allocates approximately \$400 million for the implementation of security measures in Russia that will reduce potential nuclear, biological, and chemical accountability and contamination risks.

Assessment

The environmental initiatives cited above are but a few examples of the comprehensive support the U.S. is extending to Russia. Our campaign plan is properly focused. All things considered, it is appropriately financed. We seek to help Russia conduct its own cleanup and to identify and implement high-priority low/no-cost projects that improve public health, biodiversity, economic development, and nuclear/WMD safety and security all laudable goals that promote Russian and regional stability.

Conclusion

Soviet communism's unchecked power and its obsessions with heavy industry, economic growth, national security and secrecy all combined to produce an environmental catastrophe of unrivaled proportions. Russia faces many challenges as she struggles to correct past environmental abuse and to implement programs to protect the environment for future generations. Recovery from Russia's environmental catastrophe will demand time, money, technology, legal reform, and determination from her political leadership, industry, and the populace.

Will Russia succeed? Yes, but it will take time. The progress will be heavily influenced by the attitudes of elected officials, the rate at which she is able to transition to a market economy, and her ability to generate capital. Near term progress will be very slow, given the lack of financial capital available and the many competing political priorities at hand. Additionally, "green" groups are not sufficiently developed to serve as a catalyst for significant change. Likewise, foreign investors remain hesitant to invest too heavily until legal reform is implemented and organized crime is better controlled.

Will Russia need international support? Definitely. U.S. support is properly focused. The U.S. is focusing on low-cost, high-impact programs that help to reform existing policies, share knowledge and technology, build institutional programs from local communities to the central government, and seek to implement

environmental projects that produce results and are sustainable. The level of U.S. support is reasonable given the many demands placed on our own budget, our desire to balance the budget, and the willingness of the American electorate to commit funds to foreign endeavors.

Russia's environmental well-being and the security of the world depend on her ability to rapidly transition to a democratic government and market economy. Given the level of environmental devastation and the tremendous capital investment required to mend past abuses, Russia will remain a security risk for years to come.

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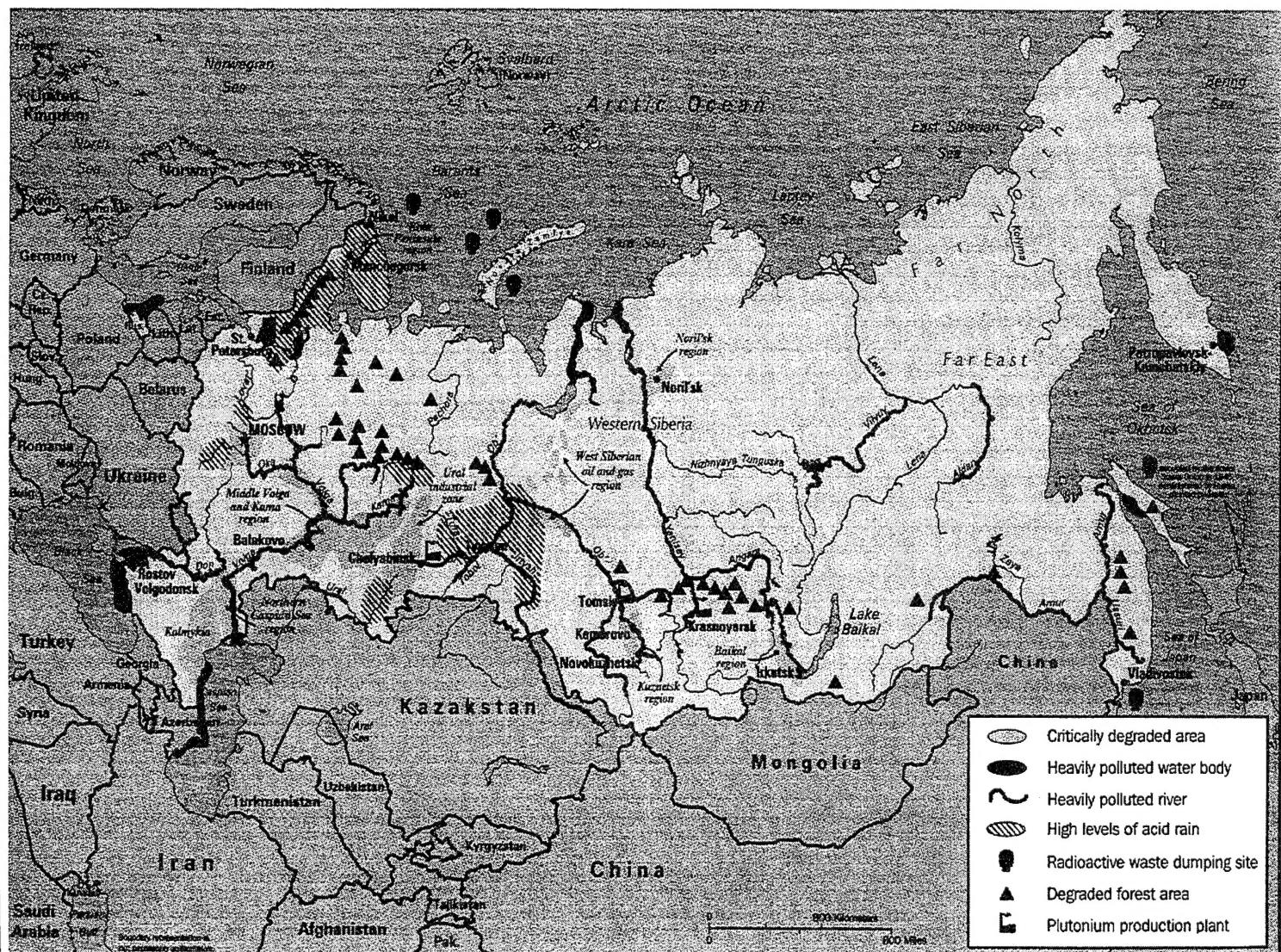
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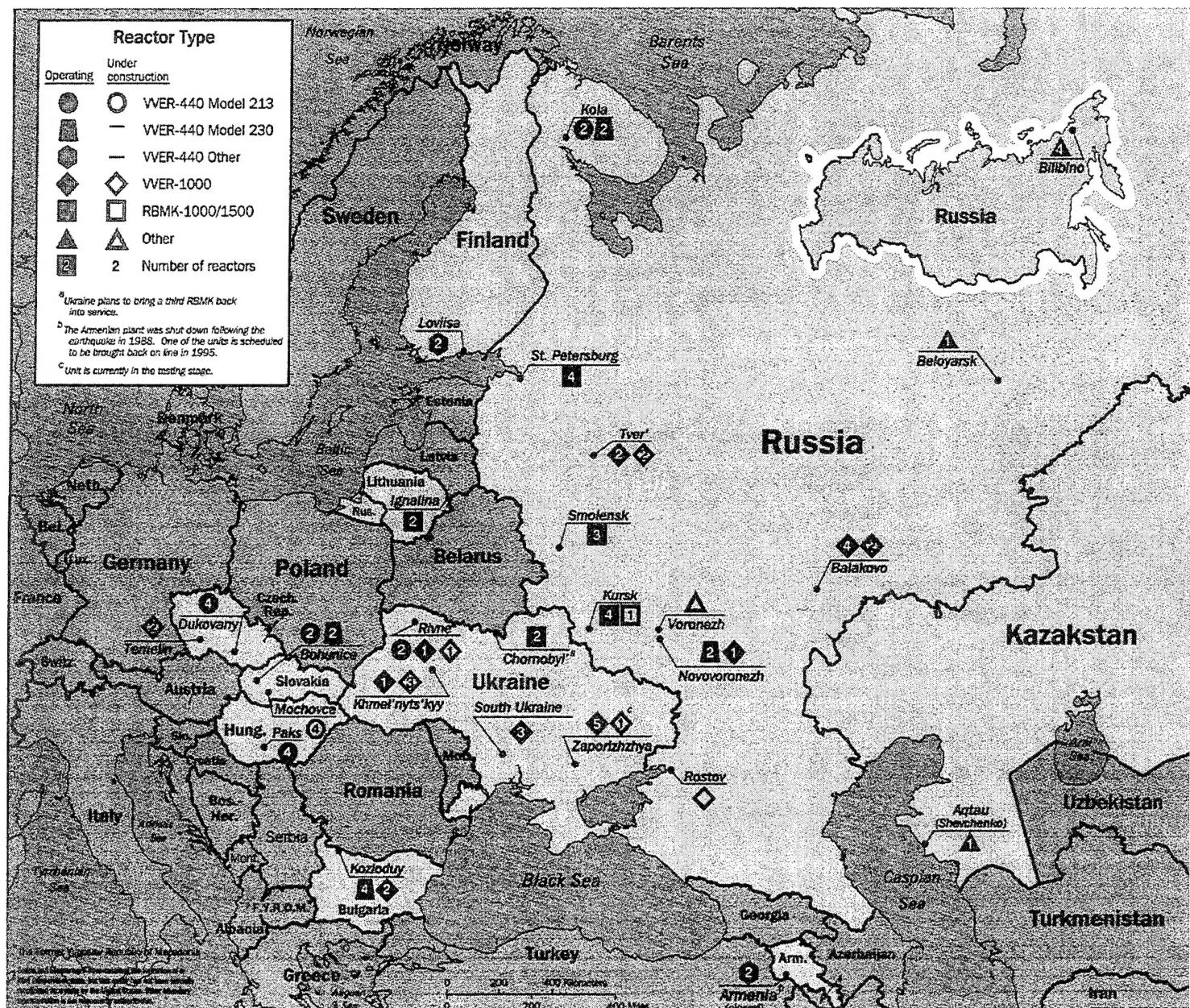
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Key Environmental Problem Areas In Russia



Soviet-Designed Nuclear Power Plant Sites



Radiation Hotspots Resulting From the Chernobyl Nuclear Power Plant Accident

